New representative data of lesbian, gay, and bisexual (LGB) people in the United States are emerging. However, research testing whether measures are similarly reliable and valid with LGB populations as they are with heterosexual populations has not kept pace with the increasing availability of representative data. The Everyday Discrimination Scale (EDS; Williams, Yu, Jackson, & Anderson, 1997) has been widely used in nationally representative data (e.g. Stucky et al., 2011; Molina & Simon, 2013) and it has been shown to be a valid measure of discrimination, particularly racial discrimination, for men and women (Stucky et al., 2011) and across different racial groups (Kim, Sellbom, & Ford, 2014; Lewis, Yang, Jacobs, & Fitchett, 2012). Despite the rigorous measurement evaluation of the EDS in these populations, the EDS has yet to be tested for measurement equivalence across groups defined by race, sex, and sexual identity in a sample of LGB adults. Prior research does suggest that LGB people of color and bisexual people may be at greater risk for racial discrimination (Kim et al., 2017) and biphobia (Watson et al., 2018), respectively, due to multiple stigmatized identities. As more nationally representative studies of LGB are conducted, it is important that researchers use constructs that are reliable and valid for LGB populations to ensure that results are not confounded by limitations of measurement. In the current study, we use a nationally representative sample of three cohorts of LGB people to tests the equivalence of the EDS across groups defined by sexual identity, race, and cohort.

Methods

Data come from the Generations Study, the first nationally representative sample of LGB adults in the United States. Participants were 1,331 racially diverse, sexual minority adults between the ages of 18-59. The survey assesses the health and lives of LGB individuals across three distinct generational cohorts. The first cohort, the "equality cohort" (n = 570) is between ages 18-25 and came of age during the debates regarding marriage equality. The second cohort, the "visibility cohort" (n =317), is between ages 34-41, and came of age during the HIV/AIDs crisis and emergence of LGBT community activism and organizations. The third cohort, the "pride cohort" (n = 444), is between the ages 52-59, and came of age during the stonewall rights and beginning of the gay rights movement.

Discrimination was measured using the EDS (Williams et al., 1997). The scale consist of nine items (see Table 1) with response options ranging from (1) never to (4) often. The identity or characteristic to which participants attributed the discrimination was not assessed until after completing the questionnaire, and participants were allowed to select all that apply. Thus, the measure of discrimination captures general experiences of discrimination. The internal reliability for the sample was high ($\alpha = .91$). *Cohort* (i.e. equality, visibility, and pride), *sexual identity* (i.e. gay/lesbian women, gay men, bisexual women, and bisexual men), and *race* (i.e. White, Black, Latinx) were used to test group invariance.

Analysis Plan

Analyses were conducted using Mplus (Muthén & Muthén, 1998-2018) and include sampling weights. First, a multi-group CFA was run for the full sample to assess the overall factor structure. Next, a configural invariance model (same pattern of free and constrained parameters) for the groups of interest (i.e. sexual identity, race, and cohort) was tested. Acceptable model fit for the configural model was met if CFI > .90, RMSEA < .08 with a 90% confidence interval between .00 and .10, and a SRMR < .08. Metric invariance (equal factor loading between groups) was only tested if the configural model had acceptable model fit, and scalar invariance (equal factor loadings and intercepts) was only tested if metric invariance was met. If one level of invariance was not met, partial invariance was tested. Given the large sample

size, X^2 will be biased, so a ΔCFI < 0.010 was used to assess invariance across conditions (Chueng & Rensvold, 2002).

Results

The initial CFA for the full sample had poor model fit. To improve model fit, errors were correlated between the items "treated with less courtesy than other people" and "treated with less respect than other people"; also, the items "called names or insulted" and "threatened or harassed" were also correlated—this improved the model fit. Correlating these items is consistent with invariance tests of the EDS in other studies (e.g. Kim, Sellbom, & Ford, 2014). Table 1 presents overall tests of invariance and Table 2 presents tests of partial invariance.

All cohort comparisons met metric invariance. Partial scalar invariance was only met when comparing the young and middle cohorts—the item "received poorer service than other people at restaurants or stores" was higher for the young cohort and "people acted as if they thought you were not smart" was higher for the middle cohort.

For race, models comparing Black and White LGB groups met metric invariance. For models comparing Black and Latinx LGB adults, the model met configural invariance. For the model comparing Latinx and White LGB groups, the measure met criteria for scalar invariance. When comparing Black and White LGB groups for partial scalar invariance, the fit improved when all intercepts were freed, suggesting the EDS was only equivalent for factor loadings. All intercepts were higher for Black compared to the White LGB group which suggests that Black LGB adults report more frequent discrimination on the measure than White LGB adults. When comparing the Latinx and Black LGB groups, only partial metric invariance was met. With the exception of "receiving poorer service", items loaded slightly higher for the Latinx group.

For sexual identity, the models comparing the EDS between gay men to gay/lesbian women, gay men to bisexual men, and gay/lesbian women to bisexual men met the criteria for scalar invariance. When comparing gay men to bisexual women, gay/lesbian women to bisexual women, and bisexual men to bisexual women, metric but not scalar invariance was met. For the model comparing gay men to bisexual women, partial scalar invariance was not met. For the model comparing gay/lesbian women and bisexual women, model fit improved when all the intercepts were free which suggest that item level means differ between gay/lesbian and bisexual women, where intercepts were higher for bisexual women with the exception of "receiving poorer service". For the model comparing bisexual women to bisexual men, model fit improved when all the intercepts were free which indicates mean item-level differences between bisexual women and bisexual men: All items were higher for bisexual women compared to bisexual men, except for the item "acted as if they were afraid of you".

Discussion

The EDS was generally equivalent regarding how items loaded onto the overall measure. However few groups by race (i.e. Latinx vs White) and some by sexual identity (i.e. gay men vs lesbian women, gay men vs bisexual men, and gay/lesbian women vs bisexual men) met scalar invariance. Partial invariance tests show that non-invariance is typically driven by item-level mean differences in the frequency of discriminatory events. Expected differences in item level means (e.g. Black LGB adults higher than White LGB adults) emerged despite the discrimination not be attributed to any particular identity. From a measurement perspective, the EDS does assess the higher prevalence of discrimination experienced by participants with more stigmatized identities. However this also means that the EDS does not measure discrimination equally across groups defined by race, sexual identity, and cohort among LGB adults—future representative studies of LGB adults utilizing the EDS need to account for non-invariance.

Table 1

Changes in CFI for configural, metric and scalar models comparing cohort, race, sexual identity, and attribution of discrimination

	Discrimination		
	CFI Configural	ΔCFI metric	ΔCFI scalar
Comparison by Cohort			
Young vs Middle	0.963	**0.003**	0.013
Young vs Old	0.977	**0.009**	0.055
Middle vs Old	0.980	**-0.001**	0.016
Comparisons by Race			
Black vs White	0.969	**0.008**	0.012
Black vs Latinx	0.974	0.017	--
Latino vs White	0.970	**0.002**	**0.003**
Comparisons by Sexual Identity			
Gay Men vs Gay/Lesbian Women	0.966	**0.003**	**0.005**
Gay Men vs Bisexual Men	0.952	**0.000**	**0.006**
Gay Men vs Bisexual Women	0.944	**0.001**	0.030
Gay/Lesbian Women vs Bisexual Women	0.967	**0.009**	0.022
Gay/Lesbian Women vs Bisexual Men	0.984	**0.002**	**0.008**
Bisexual Men vs Bisexual Women	0.945	**0.001**	0.011

Note. *CFI* = Confirmatory fit index

Table 2

Testing partial invariance for comparisons that did not metric or scalar invariance

	Young vs Middle	Young Vs Old	Middle vs Old	White vs Black	*Black vs Latino	GL Women vs Bi-Women	Bi-Women vs G men	Bi-Women vs Bi- Men
	ΔCFI	ΔCFI	ΔCFI	ΔCFI	ΔCFI	ΔCFI	ΔCFI	ΔCFI
Treated with less courtesy than other people.	0.012	0.055	0.015	**0.009**	0.016	**0.005**	0.028	**0.006**
Treated with less respect than other people.	0.012	0.054	0.015	**0.008**	**0.001**	**0.005**	0.028	**0.007**
Received poorer service than other people at restaurants or stores.	**0.005**	0.048	0.015	**0.006**	**-0.005**	**-0.004**	0.026	**0.006**
People acted as if they thought you were not smart.	**0.008**	0.047	0.014	**0.009**	**0.004**	**0.001**	0.016	**0.000**
People acted as if they were afraid of you.	0.012	0.055	0.015	**0.008**	**-0.004**	**0.003**	0.026	**-0.001**
People acted as if they thought you were dishonest.	0.012	0.052	0.014	**0.008**	**0.005**	**0.006**	0.028	**0.006**
People acted as if they were better than you.	0.012	0.055	0.015	**0.009**	**0.000**	**0.004**	0.025	**0.006**
Called names or insulted.	0.010	0.046	0.014	**0.007**	**0.000**	**0.004**	0.028	**0.007**
Threatened or harassed	0.012	0.055	0.015	**0.009**	**-0.001**	**0.006**	0.028	**0.006**

Note. * indicates that the mode tested equivalent factor loadings. Bolded values indicate that CFI <0.10